10/583690

IAP20 Rec'd PCT/PTO 20 JUN 2006

P803483/WO/1

DaimlerChrysler AG

Large bodywork part

The invention relates to a large bodywork part, in particular a hood or a front hood, according to the preamble of claim 1.

In order to reduce the severity of injuries, in particular head injuries, of pedestrians or other persons involved in a collision, hoods and/or front hoods have become known which are designed to be particularly impact-absorbing in certain regions. To this end, hoods are designed so that the impact energy which has to be absorbed on impact may be reduced by deformation of the hood. The intrusion depth of the hood should therefore not exceed a certain level in order to prevent contact with drive units arranged beneath the hood.

DE 101 09 663 A1 shows a hood designed to be impact absorbing which comprises a reinforcing internal section and is provided with an external panel. The external panel is connected to the internal section via connection elements. The connection elements in DE 101 09 663 A1 are designed as U-profiles which are attached to the panel by adhesive layers. The adhesive layers extend on the periphery of the U-profiles so that the hood is particularly reinforced in these regions. In order to design the hood with varying degrees of stiffness in different regions over its extension, the U-profiles comprise either slots or ribs in their side walls.

Increased production cost is necessary to produce the ribs and/or slots. The object of the invention is therefore to provide a large bodywork part which may be cost-effectively produced when observing the limits set for head injury during head impact.

This object is achieved by the invention in that the connection elements which connect the external panel to the internal section are configured as tongues, projecting from the internal section, which are arranged at a distance from one another. By connecting the panel to the internal section via tongues, only a few adhesive layers are now necessary. The panel therefore only bears against the internal section at few bearing points, so that advantageous deformation behavior is achieved in the event of head impact. At the same time, the requirements regarding torsional stiffness and buckling strength of the hood may therefore be observed. The tongues are configured so that they support the panel. In the event of impact, therefore, the forces are transferred via the tongues into the internal section so that by varying the size of the tongues and the shape of the tongues in various regions of the hood, different stiffness values may be implemented. Moreover, the panel takes on additional deformation work. At the same time, the production is simplified if the internal section and the tongues are produced as deep drawn parts.

In order to fasten the tongues to the external panel in a durable manner, each tongue comprises a flange which receives an adhesive layer and against which the panel may selectively bear. It is also possible by varying the flange measurements to adjust the stiffness.

Advantageously, the tongues and the internal section may be configured integrally, in order to economize on production costs. In a preferred embodiment, the internal section comprises a frame which overlaps an edge region of the external panel and which forms at least one recess. The external panel and the frame are interconnected in these edge regions.

Profiled members arranged in a latticework manner relative to one another may extend within the recess formed by the frame, the tongues projecting from the profiled members. This has the advantage that the stiffness may be easily formed according to the respective impact region, for example the child's head impact region or adult impact region.

In one embodiment, two profiled members may be arranged within the recess of the frame which extend in the longitudinal direction of the vehicle and which are attached to a partial region of the recess which is closed by means of a structural component.

According to claim 8, in a further embodiment, two tongues project obliquely upwards from the profiled members in a mirror symmetrical manner, resulting in a W-shaped cross-section of the profiled member and the tongues. This cross-section produces optimal deformation behavior, particularly in the immediate vicinity. Optionally, the tongues may also be arranged asymmetrically. The arrangement of the tongues on the internal section is selected according to the desired stiffness of the hood.

An embodiment is shown in Figures 1 and 2, in which:

Figure 1	is a plan view of an internal section of a hood and
Figure 2	is a cross-section according to the line II-II.

Figure 1 shows an internal section 1 of a hood, not shown in more detail. The internal section 1 comprises a frame 2 which forms a recess 3. Within the recess 3 are two profiled members 4 and 5 arranged in the longitudinal direction of the vehicle. The profiled members 4 and 5 are attached to a structural component

6 which closes a partial region of the recess 3. Three apertures 7, 8 and 9 are therefore inserted in the internal section 1 which are separated from one another by the profiled members 4 and 5. Further material recesses 11 are inserted in the edge region 10 of the frame 2 facing the windshield.

As is revealed in particular from Figure 2, the profiled member 4 is configured as a grooved profile 12 with two limbs 13 and 14. A tongue 15 and/or 16 is attached to each limb 13 and/or 14. The tongue 15 and/or 16 comprises at its free end a flange 17 and/or 18. The upper face of the flange 17 and/or 18 extends substantially parallel to the external panel 19 of the hood. Between the upper face of the flange 17 and/or 18 and the lower face of the external panel 19 an adhesive layer 20 is applied which connects the external panel 19 to the internal section 1.

In the event of impact with the hood the forces are conveyed into the external panel 19 according to arrow F. By means of the selective and/or linear support of the external panel 19 said external panel may yield and, as a result, transfers the forces via the flange 17 and/or 18 into the tongues 15 and 16 and thus into the internal section 1. The stiffness of the hood may therefore be designed in an optimal manner according to the number of tongues and the size of the tongues. Similarly, by the specific choice of adhesive stiffness and/or strength and the size of the adhesive surface, the energy absorption of the hood may be influenced in a favorable manner. The reduction of the adhesive surface may be used to economize on adhesive.